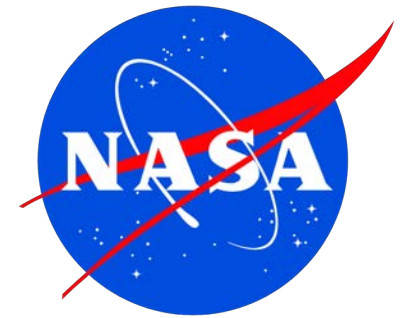# Sensorimotor Predictors: Examining the Relationship Between Measures of Post-landing Sensorimotor Functional Task Performance

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Study Status Overview

- Purpose: Identify a set of behavioral, neuroimaging and genetic measures that can potentially be used to predict and better explain early performance following G-transitions such as return to Earth on a set of sensorimotor tasks

- Recruiting ISS astronauts who previously participated in sensorimotor field tests and/or dynamic posturography (MedB) within R+1 day following long-duration spaceflight

- Status: 15 of 30 crewmembers recruited

- This presentation will focus on three quantitative post-flight functional task outcomes and a *new* subjective self-rating of post-flight decrements and recovery
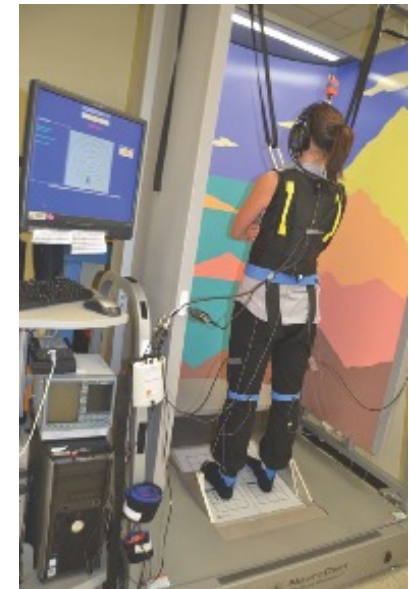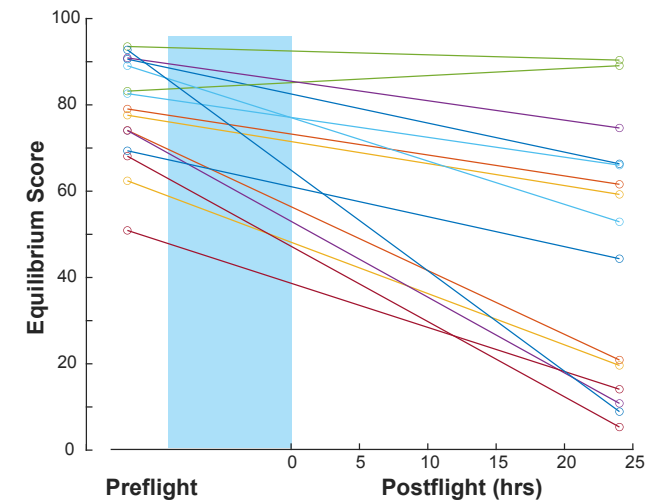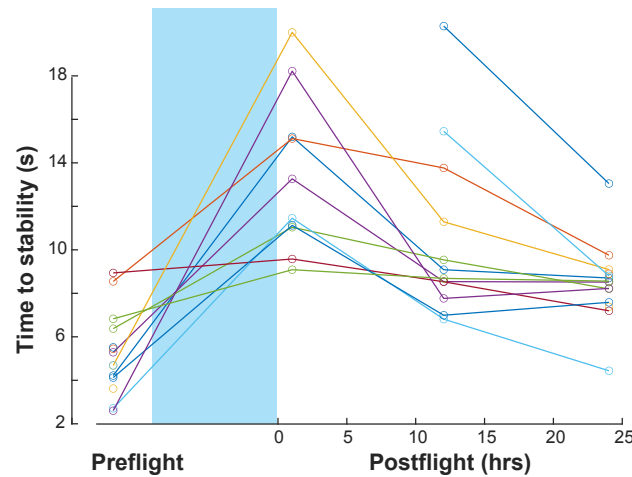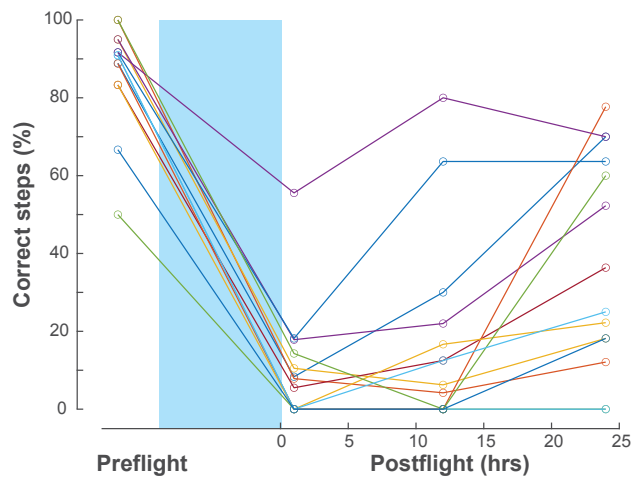
Post-Flight Outcomes

Tandem Walk
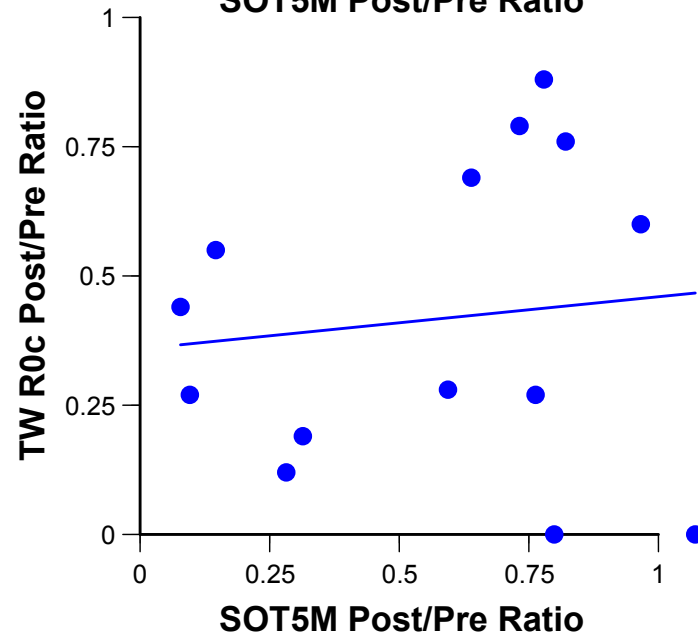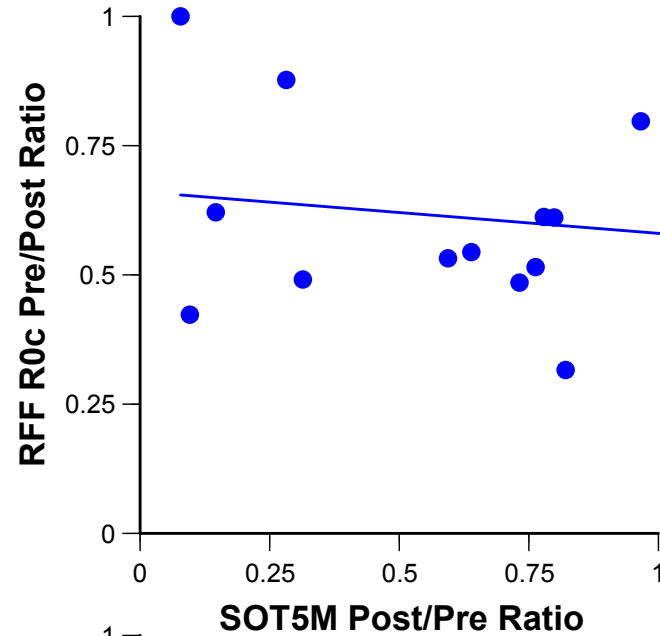
Recovery from fall / prone-to-stand

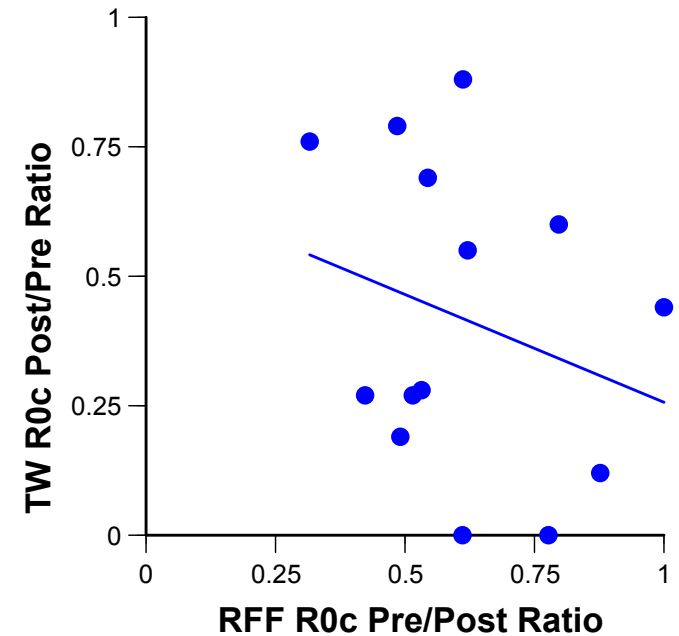Posture (5/5M)

Relationships between Post-flight Outcomes

Eyes open

Eyes closed

Ratio score (Post/Pre)
Higher -> Closer to preflight levels

Subjective Self-Ratings

- Initiated a subjective survey to ask crewmember to rate *severity* and *time to recover* for functional tasks impacts, e.g.:
  - 4 – Severe impacts, tasks not attempted, deliberate restriction of motion
  - 3 – Moderate impacts requiring extended time to complete tasks
  - 2 – Mild or transient impacts, worse during or following certain motions
  - 1 – Functioning nominally but with increased effort
  - 0 – No impact or restriction of movements

- Ratings also allow for comparison of in-flight and post-flight severity and time to recover, as well as across missions

- Open ended question requests crew recommendations, e.g.:
  - *Medications help, best to pre-medicate prior to deorbit*
  - *Limit head movements*
  - *Close eyes during chute opening*

Preliminary Findings

- There is considerable variability among the post-flight performance outcomes for the 15 participants to date

- While there is a strong association within tests obtained at different R+0 timepoints, by R+24 hr performance on one post-flight test does not necessarily correlate with performance on other post-flight tests

- Subjective reporting can provide insight into the individual variability, especially steps taken to mitigate impacts to performance

- These results underscore the importance of a clinical assessments utilizing surrogate measures that allow the sensory cues (e.g., vision) anticipated during operational tasks